

# A Surgical Case of Left Ventricular Pseudoaneurysm Complicating Myocardial Infarction in a Diabetic Patient on Dialysis

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**A 57-year-old man was hospitalized with dyspnea and heart failure. We performed an electrocardiogram, coronary angiogram, echocardiogram, and magnetic resonance imaging. He was diagnosed with a left ventricular pseudoaneurysm (i.e., heart tumor) at the posterolateral wall. Minimal contrast medium was utilized when making the diagnosis as the patient was on dialysis. We subsequently repaired the ventricular unruptured pseudoaneurysm and performed a coronary artery bypass grafting. This case presented difficulty in ascertaining the difference between a cardiac tumor and a ventricular pseudoaneurysm. (Ann Thorac Cardiovasc Surg 2007; 13: 213–215)**

**Key words:** left ventricular pseudoaneurysm, coronary artery bypass grafting, magnetic resonance imaging, diabetic patient

## Introduction

Left ventricular pseudoaneurysm is a rare complication of transmural myocardial infarction. It forms when a cardiac rupture contains adherent pericardium or scar tissue. Left ventricular pseudoaneurysm is clinically uncommon, diagnosis is difficult, and rupture often leads to death.<sup>1)</sup> We report on a case of a diabetic patient who underwent a successful repair of a left ventricular unruptured pseudoaneurysm and coronary artery bypass grafting (CABG). This was performed as there was difficulty in ascertaining the difference between a cardiac tumor and a ventricular pseudoaneurysm at the time of diagnosis.

## Clinical Summary

A 57-year-old man was hospitalized with dyspnea and

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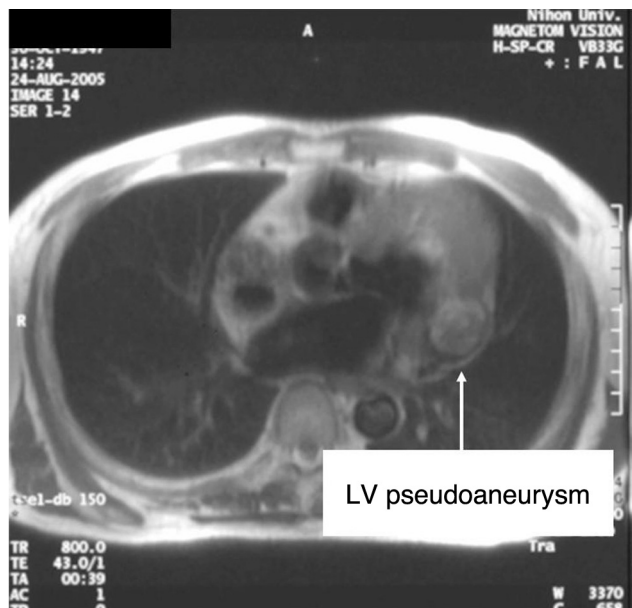
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heart failure (Class III, New York Heart Association). Electrocardiogram showed sinus rhythm, and a qR pattern with T wave inversion in leads II, III, and aVF, suggesting an old inferior infarction. We suspected an old myocardial infarction, and performed other examinations.

Echocardiogram showed mild left ventricular systolic dysfunction (ejection fraction 36%) and a large cavity (35×30 mm) at the posterolateral left ventricle. A color-flow Doppler echocardiogram showed no flow in the cavity. A coronary angiogram showed that the left main trunk was 50% stenosed, with a 90% stenosis in the left anterior descending (#6, #7), left circumflex (#12, #14), and right coronary artery (#2, #4 posterior descending). The left ventricular pseudoaneurysm was not detected by left ventricular angiography. A cardiovascular magnetic resonance was performed, revealing a 35×40 mm posterolateral left ventricular mass which appeared as an isolated cavity (Fig. 1). We did not use contrast medium because the patient was on dialysis. We then performed gallium scintigraphy to differentiate between a ventricular pseudoaneurysm and a malignant tumor. No area of accumulation was shown. Our diagnosis was a ventricular pseudoaneurysm or cardiac tumor, hence we planned to perform CABG and tumor resection.



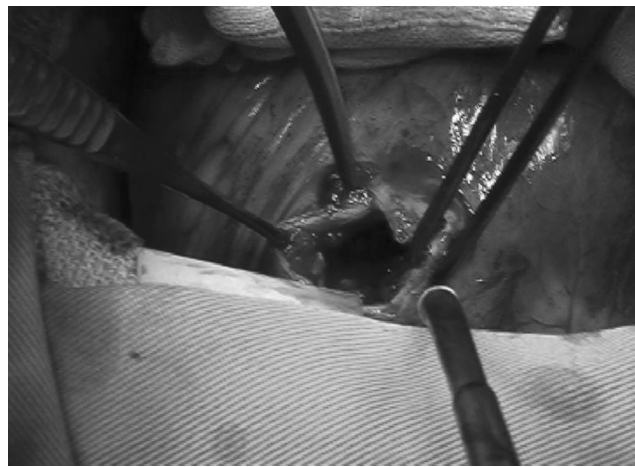
**Fig. 1.** Cardiovascular magnetic resonance showed a 35×40 mm posterolateral left ventricular mass which appeared as an isolated cavity.

At surgery, we incised the center of the mass. It was filled with clotted blood and the wall contained pericardium with scar tissue, with a 5-mm myocardial defect (Fig. 2). We performed a thrombectomy, and the wall was plicated with polyester felt strips. Following this, we performed three CABGs with a thromboendarterectomy of the right coronary artery, left anterior descending and obtuse marginal branch. After the operation, a pathologic examination of the resected aneurysm was performed. The diagnosis of ventricular pseudoaneurysm was based on the presence of pericardial tissue and the absence of myocardial fibers in this case. The postoperative course was uneventful, and he was discharged on the 14th postoperative day.

## Discussion

A left ventricular pseudoaneurysm is a rare and serious complication of transmural myocardial infarction. Pseudoaneurysms are often asymptomatic and diagnosed accidentally. Surgical treatment is recommended since the risk of an untreated pseudoaneurysm rupturing is approximately 30–45%.<sup>1,2)</sup>

The long-term outcome of an untreated pseudoaneurysm has been reported.<sup>3)</sup> Usually, it appears several weeks after myocardial infarction, and more than half of the cases are localized on the posterolateral wall. An inflammatory



**Fig. 2.** The mass was filled with clotted blood and the wall contained pericardium with scar tissue, with a 5-mm myocardial defect.

reaction of the posterior pericardium might result in pericardial adhesions and form a posterior left ventricular pseudoaneurysm.<sup>4,5)</sup>

Echocardiography and left ventricular angiography are considered the best available tests for diagnosing left ventricular pseudoaneurysms. Usually, color-flow Doppler echocardiogram shows turbulence across the neck of the aneurysm. In this case, preoperative diagnosis was difficult for the following reasons. First, the defect was very small and the sac was filled with clotted blood; therefore, the blood turbulence might have been very small and we could not detect it. Second, the left ventricular angiography might not have been perpendicular to the pseudoaneurysm, and the pseudoaneurysmal sac was overlapped with the left ventricle. If the patient has normal renal function, magnetic resonance imaging and computed tomography with contrast medium are useful tools for making the diagnosis.

Finally, we successfully repaired the left ventricular unruptured pseudoaneurysm and performed CABG in a case that presented difficulty in differentiating between a cardiac tumor and a ventricular pseudoaneurysm preoperatively. This was because the patient had no symptoms due to diabetes mellitus. As the patient was on dialysis for renal dysfunction, we could not use the contrast medium to aid preoperative diagnosis.

## References

1. Dachman AH, Spindola-Franco H, Solomon N. Left

- ventricular pseudoaneurysm. Its recognition and significance. *JAMA* 1981; **246**: 1951–3.
2. Vlodayer Z, Coe JI, Edwards JE. True and false left ventricular aneurysms. Propensity for the latter to rupture. *Circulation* 1975; **51**: 567–72.
  3. Moreno R, Gordillo E, Zamorano J, et al. Long term outcome of patients with postinfarction left ventricular pseudoaneurysm. *Heart* 2003; **89**: 1144–6.
  4. Frances C, Romero A, Grady D. Left ventricular pseudoaneurysm. *J Am Coll Cardiol* 1998; **32**: 557–61.
  5. Brown SL, Gropler RJ, Harris KM. Distinguishing left ventricular aneurysm from pseudoaneurysm. A review of the literature. *Chest* 1997; **111**: 1403–9.